

REMARKS

Claims 1-7, 32-43, and 49-58 remain pending in this application.

Amendment

Claims directed to a “tangible computer readable medium embodying a computer program” are amended to read, “computer readable storage medium embodying a computer program . . .” to conform with Applicants’ preferred phraseology. By this Amendment, applicant does not change the scope of the claims. Specifically, the added term, “storage” is redundant of “embodying.” The term, “tangible,” which was removed, added nothing to the scope of the claims since, again, the term, “embodied” implied “tangible.” No change in claim scope is made or intended by this Amendment.

This amendment is made without prejudice. No new matter is introduced by this Amendment.

Specification

The specification is under objection for “failing to provide proper antecedent basis for the claimed subject matter.” In particular, the Office action states that the term, “tangible computer readable medium” is not described in Applicant’s specification and therefore it is unclear whether the claims meet requirements under 35 U.S.C. § 101. (Office Action, page 2).

In a telephone conversation with Examiner Chankong on March 17, 2009, the Examiner stated that the reference to 35 U.S.C. § 101 was in error. In further discussion on March 18, 2009, the Examiner stated by phone, after consultation with his Supervisor and Tech Center Special Programs Examiner, that the term, “tangible,” lacking a definition in the specification, is defined as “capable of being perceived” and therefore potentially reads on matters outside the scope of § 101 since a signal can be perceived. by way of example, the Examiner stated that “tangible” could read on a copper wire that carries a signal. The Examiner further stated that claims containing the term, “tangible” are indefinite and could have and perhaps should have been rejected under 35 U.S.C. § 112, second paragraph on that basis, and further that the specification is objectionable for failing to adequately define the term, “tangible.”

With regard to the suggestion that a copper wire carrying a signal is non-statutory, Applicants respectfully disagree and would like to see some legal basis for this interpretation of 35 U.S.C. §

101.

Applicants are submitting herewith a Petition under 37 C.F.R. § 1.181 for review by the Director of this objection, and arguments made in the petition submitted herewith are hereby referenced and incorporated herein by reference. Applicants respectfully request reconsideration in view of the arguments presented in the accompanying Petition and withdrawal of the outstanding objections to the specification.

Claim Rejections

Applicants note with appreciation the withdrawal of previous grounds of rejection and indication of allowable subject matter in claims 2, 3, 5-7, 38, 41-43, and 49-58. However, claims 1, 4, 32-37, 39, and 40 stand rejected under new grounds of rejection.

Claims 1, 4, 37, 39, and 40 stand rejected under 35 U.S.C. § 103(a) for being unpatentable over U.S. Patent 5,257,386 issued to Saito (hereinafter, “Saito”) in view of U.S. Patent 6,970,913 issued to Albert et al. (hereinafter, “Albert”). Claims 32-36 stand rejected under 35 U.S.C. § 103(a) for being unpatentable over Saito in view of Albert, and further in view of U.S. Patent 7,213,246 issued to Rietschote (hereinafter, “Rietschote”).

Applicants respectfully traverse because the prior art fails to teach or suggest each and every feature set forth in the claims, and because the Office Action does not set forth a cogent rationale as to how a person having ordinary skill in the art could have arrived at the claimed invention based on the cited references.

Claims 1 and 37 set forth, *inter alia*:

“selecting one path of the plurality of paths according to an algorithm, which takes as inputs at least contents of the multipath routing information and contents of the VM-specific information; and

“routing a physical data transfer request corresponding to the virtual data transfer request to the data storage system over the one path that was selected”

Applicants agree with the statement in the Office Action that, “Saito does not expressly disclose: using the contents of the VM-specific information as part of the algorithm for selecting a path.” However, the Office Action cites Albert for teaching this feature, stating, “Albert further discloses utilizing the contents of VM-specific information (a priority of the VM) as part of an

algorithm for selecting a path (connection) [Fig. 12 | column 30 <<lines 1-60>> : selecting a connection using weights of the virtual machines].” Applicant respectfully disagrees with this interpretation of Albert.

Albert describes a load balancing network using redundant load-balancing servers (referred to generically as “service managers”) and forwarding agents for passing messages received across a network connection to one of a plurality of servers and/or clusters. The service managers and forwarding agents take the place of a single network service appliance (e.g., a load balancer) which can be interposed between an external network connection and a plurality of back-end servers. Albert therefore removes this single point of failure and replaces it with redundant systems.

Albert uses the term, “load balancing” according to its generally-understood meaning. As stated by Albert, in load balancing, “users are spread to available systems based on the load on each system” (col. 3, lines 40-42). Thus, the load and capacity of each back end server is taken into account when deciding which server to assign a particular client or user request.

1. Albert does not teach “VM-specific information” as set forth in the claims.

The office action states that “Albert discloses the ability to select paths based on VM-specific information such as the VM’s priority enables selection to based on additional factors such as the VM’s amount of processing capacity” (Office Action, top of page 5).

In Applicants’ disclosure, the term, “virtual machine” (or “VM”) refers to an *abstraction of a physical machine that exists in the software domain and runs on a particular computer system*. See, e.g., paragraph 3 or Figure 1 of the Application as filed. Even within the claims themselves, claims 1 and 32 set forth, “a virtual machine *in* a computer system” (emphasis added). In Albert however, the term “virtual machine” refers to a *cluster of servers (or hosts)*. See, e.g., Albert, column 11, lines 8-10 or Figure 11A, showing “virtual machines” 1112, 1114, and 1116 which each include a plurality of physical hosts 1102, 1104, and 1106. Since claims 1 and 32 specify, “a virtual machine in a computer system” and Albert only discloses virtual machines that exist as a plurality of computer systems, Albert does not teach “virtual machine” within the meaning of claim 1. Therefore, the term, “VM-specific information” of Albert is distinct from, and does not read on, “VM-specific information” set forth in the claims.

Thus, neither Albert nor Saito teach “using VM-specific information” as set forth in each of

the independent claims. Accordingly, Applicants respectfully submit that all the claims should be allowed over the prior art of record. Reconsideration and withdrawal of the outstanding rejections is therefore respectfully requested.

2. VM-specific information of claims refers to information regarding the *source of the request, or client, not the target or server.*

It should be noted that claim 1 sets forth, “identifying the request issued by the first VM. . . ; . . determining VM-specific information related to the first VM” Thus, the information relates to the entity issuing the request, typically referred to as the client, and not the destination of the request, which is the server. In both Saito and Albert, only information regarding either the paths or destination (server) are used in selecting the path or connection. The claims provide that a request is issued by a VM and the path chosen over which the data is transferred depends at least in part on *information specific to the VM that issued the request.* In contrast, the Office Action identifies VM-specific information from a “virtual machine” (cluster, in Albert) which is the *target* of a message, not the issuer of the message. This is because Albert is directed to load balancing, in which the load balancing server selects among a plurality of back-end servers to handle requests from clients so that the load is evenly distributed across the plurality of servers.

Since each of the independent claims specify that the request is issued from a VM and information related to that VM is relied upon, at least in part, in determining a path over which the request should be transmitted, and none of the references teach or suggest this feature, Applicants respectfully submit that all pending claims should be allowed. Reconsideration and withdrawal of the outstanding rejections is therefore respectfully requested.

3. Rietschote does not cure the deficiencies of Albert and Saito

Claims 32-36 are rejected based in part on Rietschote. Rietschote is cited for teaching VM fail-over. Rietschote does not describe a multipath storage system and hence does not teach or suggest using VM-specific information in selecting one path of the multipath storage system over which to send the request.

Applicants note that none of the references of record teach or suggest each and every limitation set forth in the claims 32-36. Claim 32, for instance, specifies:

“identifying [a] request issued by the first VM, the request being a virtual data transfer request. . . ; identifying a plurality of

possible paths over which the request could be routed from the computer system to the data storage system. . . ; determining whether a failure has occurred that prevents the transfer of data over a first path of the plurality of possible paths; determining VM-specific information related to the first VM; and deciding whether the first VM should be migrated to a different physical computer system according to an algorithm, which takes as inputs at least the contents of the VM specific information. . . .”

Since Rietschote does not teach a multipath storage system, it does not teach using VM-specific information in determining whether to migrate a VM when a failure occurs that prevents the transfer of data over a first path of the multipath storage system. Instead, Rietschote focuses on identifying a failure of an application executing within the VM, or the VM itself, to determine when a failover should occur (see, e.g., col. 7, lines 29-57).

Since the references cited do not teach or suggest each and every claim set forth in claims 32-36, Applicants respectfully submit that these claims are allowable. Reconsideration and withdrawal of the outstanding rejection is respectfully requested.

4. Office Action lacks cogent rationale as to how a person having ordinary skill in the art could have arrived at the claimed invention based on the cited references.

With respect to the differences between the claimed subject matter and the cited art of reference, Applicants respectfully submit that such differences are not obvious. Under *KSR*¹, a number of rationales are available to the Patent Office to issue an obviousness rejection. However, regardless as to the rationale, it must be clearly articulated why the claimed invention would have been obvious. Applicants respectfully submit that such a clear articulation has not been provided. For instance, it has not been explained how the two references, Saito and Albert, or Saito, Albert, and Rietschote, could be combined to arrive at the claimed invention or why such a combination would have been attempted. In the present case, the Office Action does not cite any such rationale, and merely states conclusively that the proposed substitutions and modifications would have been obvious. See, e.g., the sentence bridging pages 4 and 5 of the Office Action, and the sentence at page 6, lines 12-15.

¹ *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. 398, 82 USPQ2d 1385 (2007)

Applicants submit that the present Application is in condition for allowance. Applicants therefore request reconsideration of the outstanding rejections and issue a Notice of Allowance. The Examiner is invited to contact the undersigned at 650-427-2390 to discuss any additional changes the Examiner may feel is necessary in light of this Amendment.

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Respectfully submitted,

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